



Valve Box and Valve Accessories G4315A, G4316A, G4317A

Installation Guide

The G4315A, G4316A, and G4317A accessories consist of separate kits depending on the custom configuration ordered. These kits may include one or more of the following:

- Heated valve box kit
- Valve hardware installation kit
- Valve(s)

Table 1 and Figure 1 list and show the contents of the heated valve box kit.

Table 1 Heated valve box kit contents

Description	G4315A	G4317A
	G4316A	
Screw, M4 x 12 mm, Torx T-20	2	2
Screw, M4, Torx T-20, chrome-plated	4	4
Nut plate	2	2
Valve box, 1 heated zone	1	
Valve box, 2 heated zones		1



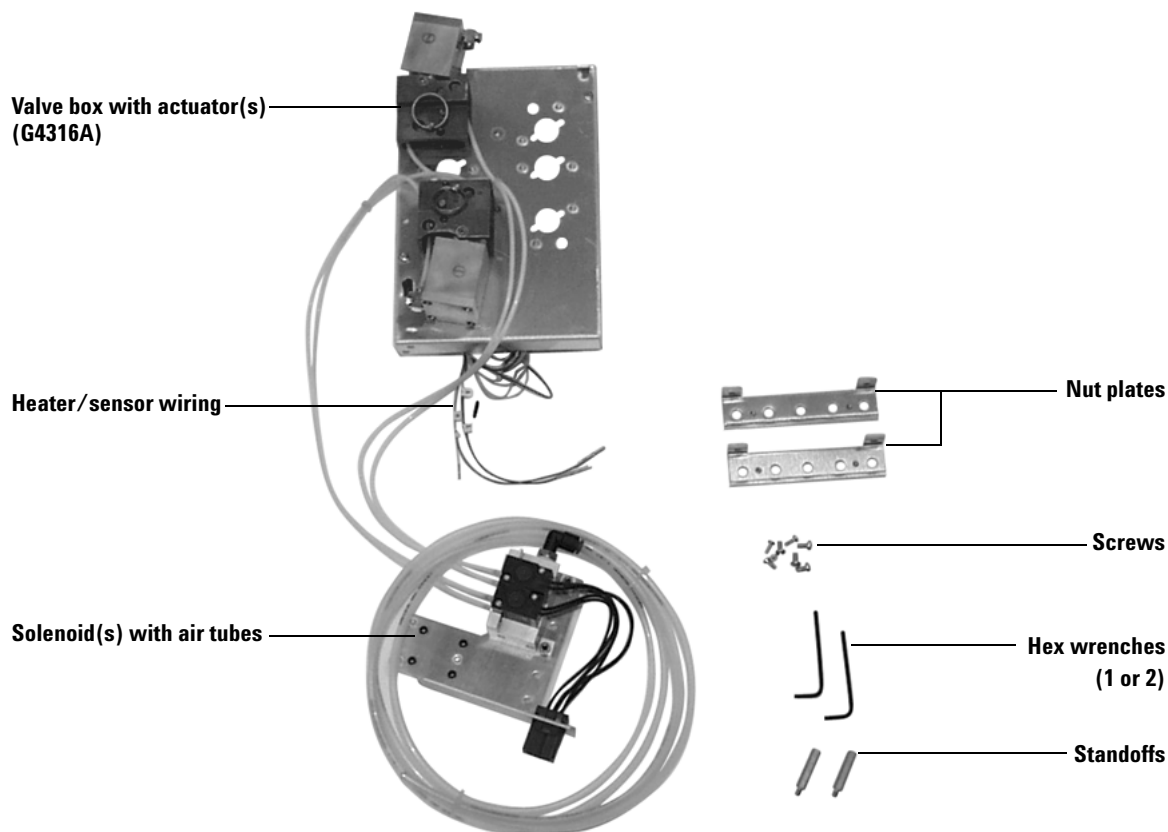


Figure 1 Heated valve box kit contents

NOTE

The solenoids and valve actuators are assembled and tested at the factory. Do not disassemble them or break any electrical or air connections.

Table 2, Figure 2, and Figure 3 list and show the contents of the valve hardware installation kits.

Table 2 Valve hardware installation kit contents

Description	Kit G2739A (Liquid sample)	Kit G2740A (Gas sample)
Metering valve 1/16-inch	1	
Screw, M3 x 8 mm	2	1
Screw, M3 x 30 mm, chrome-plated	2	1
Label	1	1
Screw, thread-cutting	4	
Screw, M4 x 12 mm, Torx™ T-20	4	
Fitting, column bulkhead	1	4
Nut, 5/16-inch	1	4
Restrictor bracket	1	
1/16-inch SS tube, 102 mm long	1	1
1/16-inch SS tube, 203 mm long		1
1/16-inch SS tube, 360 mm long	1	2
1/16-inch SS tube, 400 mm long	1	1
1/16-inch SS tube, 560 mm long	1	5
1/8-inch nut and ferrule set	1	1
Filter union, reducing		1
Reducer/restrictor, SS		1
Actuator limiter, 36 degrees	0	1

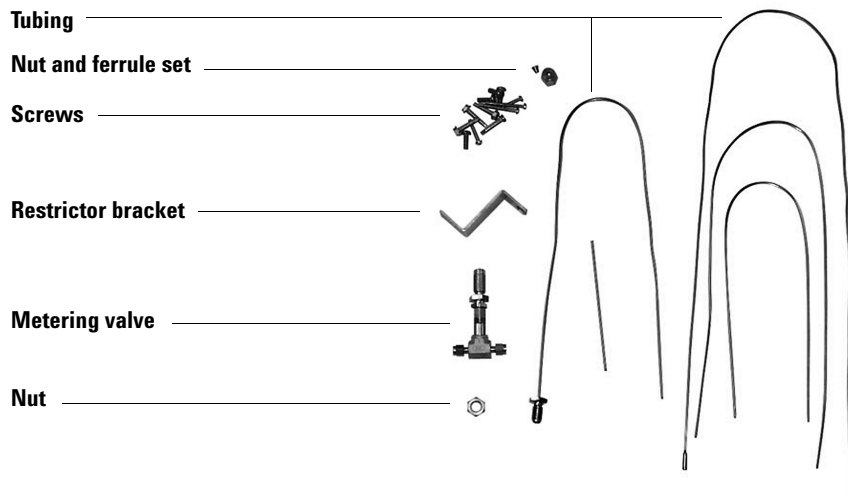


Figure 2 Kit G2739A, liquid sample valve

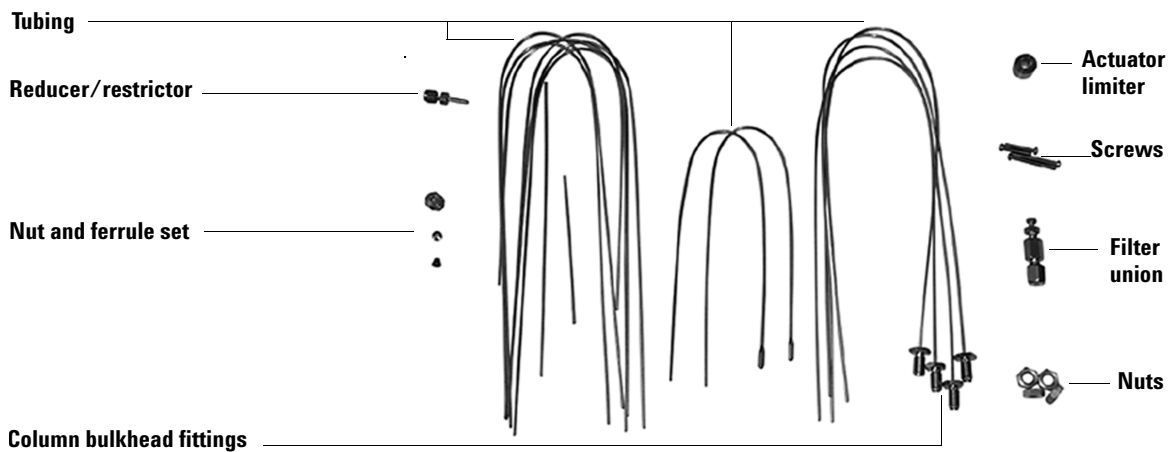


Figure 3 Kit G2740A, gas sample valve

Tools needed

Torx T-10 and T-20 drivers
Flat blade screwdriver
Needle-nose pliers
3 mm hex key wrench

Installing the Heated Valve Box

WARNING

The oven, inlet, and detector may be very hot. Before proceeding, turn off the oven and all other heated zones and let them cool down.

Harmful gases may be present. Hydrogen (if used) can present an explosion hazard. Before proceeding, turn off all supply gases at their sources.

Shock hazard. Before proceeding, turn off the GC and disconnect the power cord.

Install the valve box

- 1 Install two chrome-plated screws about halfway into each of the two nut plates as shown in [Figure 4](#).

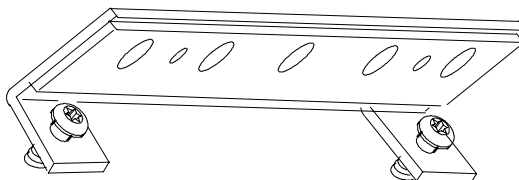


Figure 4 Install the nut plate screws

- 2 Inside the oven, locate the pair of T-shaped cutouts on the left wall and match them with the two tabs on the nut plate (see [Figure 5](#)). Slide the tabs on the nut plate into the oven cutouts so that the screws rest on the bottom of the T. Repeat on the right side of the oven. Tighten the screws.

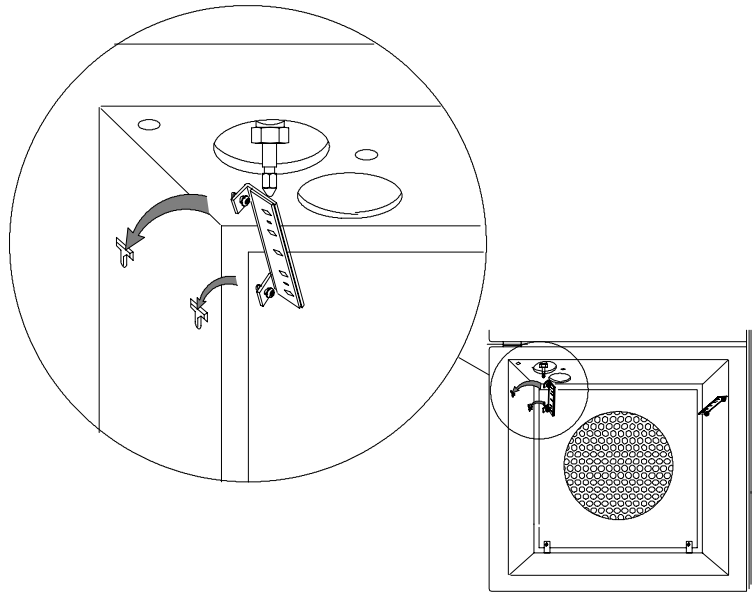


Figure 5 Attach the nut plates

- 3** Clip the notches holding the rectangular cover plate on top of the oven with diagonal cutters (see [Figure 6](#)). Hold the cutters with the flat face to the outside to remove as much of the nibs as possible. Remove the plate.



Figure 6 Valve box location

- 4** Install one screw where shown in [Figure 6](#). Do not tighten.
- 5** Place the valve box on the oven top and move it to the rear so that it slides under the screw.
- 6** Install another screw at the front of the box (see [Figure 6](#)). Tighten both screws.

Install and wire the solenoids

The internal valve wiring is located near the top center of the main board. To access it, you must remove the right side panel.

WARNING

Removing the side panel exposes dangerous voltages. Turn the instrument off and disconnect it from its power source before proceeding.

- 1 Attach the solenoid assembly to the main board.

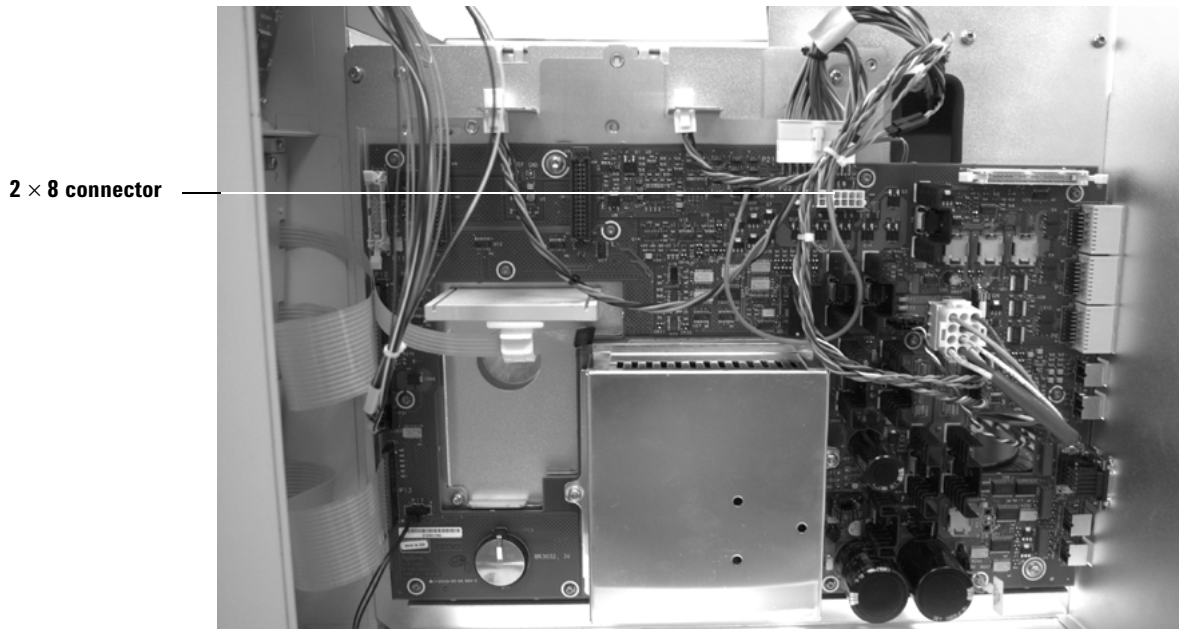


Table 3 2 x 8 connector location

- 2 Place the tubing and cables in the slots in the chassis just above the solenoids.

- 3** Uncoil the air supply tubing and pass it through the hole in the back of the GC as shown in [Figure 7](#).

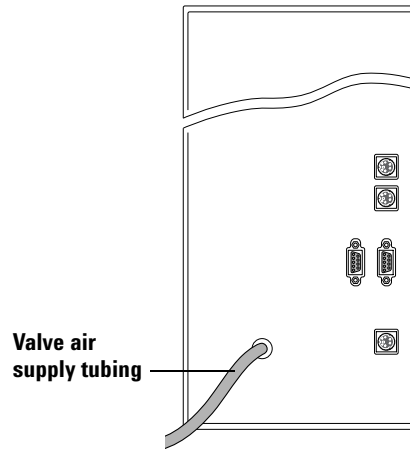
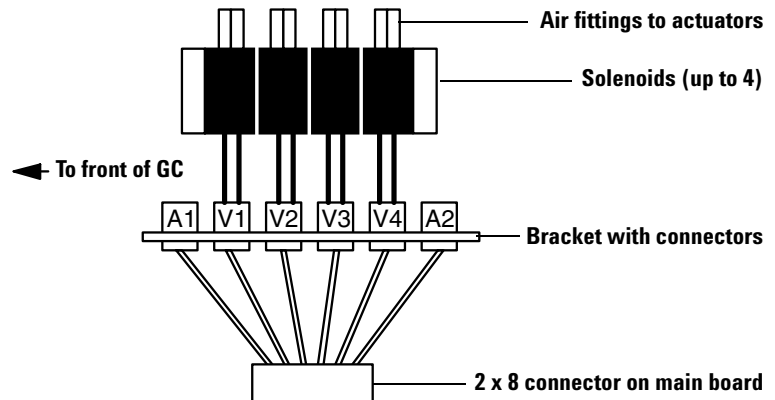


Figure 7 Valve actuator air tubing

NOTE

The connectors are prewired so that the Valve 1 driver controls the solenoid closest to the front of the GC, Valve 2 controls the next one, etc.



If you ever need to remove a connector from the bracket, press the locking tabs on the side and pull the connector down. To insert a connector, push it up into a bracket hole until it locks.

- 4 Plug the heater/sensor cable(s) into connector A1 (Aux 1) and/or connector A2 (Aux 2).

Installing Valves In a Heated Valve Box

WARNING

Do not install a liquid sampling valve (LSV) in the valve box if you plan to heat the box above 75 °C. Heating an LSV over 75 °C can cause a leak and subsequent explosion. Liquid sampling valves should be mounted in the side location to avoid potential explosions.

- 1 Remove the heater block mounting screw in the lower valve box.

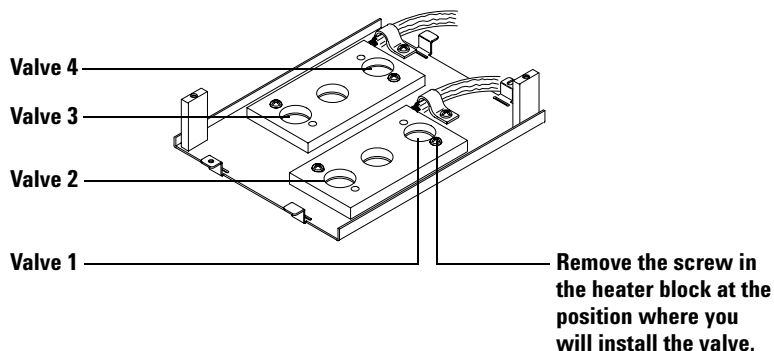


Figure 8 Removing the heater block screw

- 2 Place the valve in the desired position in the valve box. The valve rotor index pin of a 6-port valve points toward the back of the GC if installed correctly. This is the ON position. Tighten the two screws with a Torx T-10 screwdriver. If this is the last valve to be installed in the heated zone, make sure the screws that secure the heater block to the lower valve box are tight.

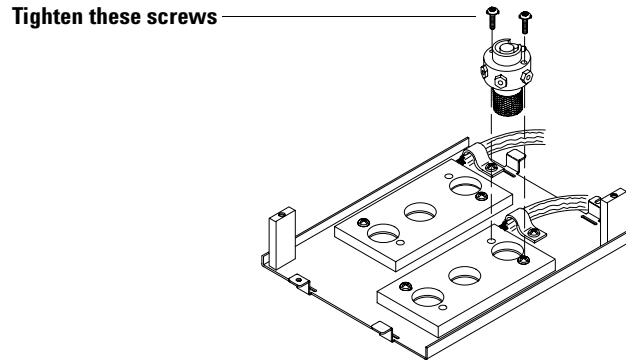


Figure 9 Installing the valve

- 3** Use needle-nosed pliers to move the valve rotor index pin of the valve counterclockwise until the pin touches the valve stop (OFF position).

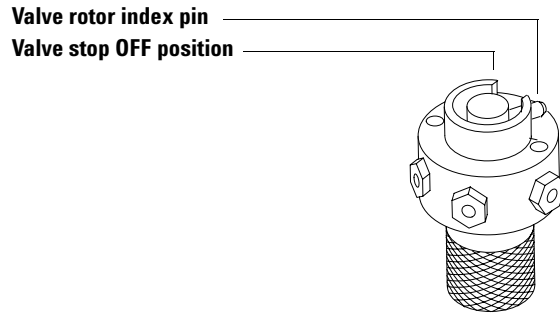


Figure 10 Index pin and stops

- 4** Use the tubing and fittings in the hardware installation kit to plumb the valves. See [“Common Valve Configurations”](#) on page 19.

Install the upper valve box

- 1 Verify that all valve rotors are in the full counterclockwise position.
- 2 For each actuator, set the appropriate degree of rotation for its valve by moving the pin to the required limiting hole (see [Figure 11](#)):
 - Four-port valves—place the pin in the 90° hole
 - Six-port valves—place the pin in the 60° hole
 - Ten-port valves—place the pin in the 60° hole with the tubular 36° actuator limiter on the pin

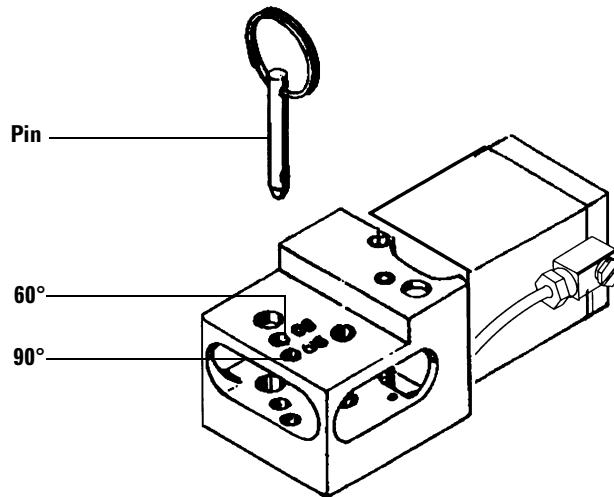


Figure 11 Setting the actuator's degree of rotation

- 3 For each actuator, loosen the link arm lock screw in the barrel of the shaft that links the valve and actuator about 1/4 turn (see [Figure 12](#)). You may have to apply significant pressure.

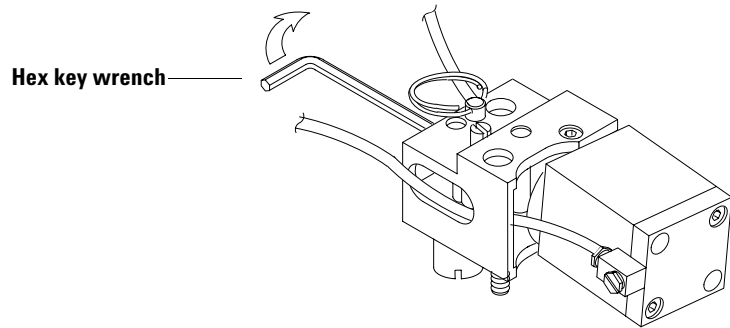


Figure 12 Loosening the lockscrew

- 4** For each actuator, use a flat blade screwdriver to turn the actuator coupling/shaft assembly counterclockwise until snug.

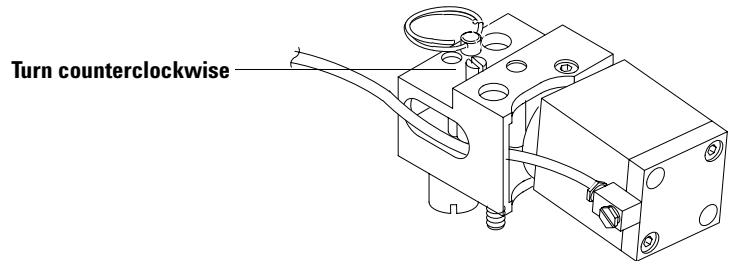


Figure 13 Setting the coupling shaft

- 5** Locate the two half-moon cutouts at the bottom back of the upper valve box. Place the upper box on top of the lower valve assembly, routing the heater/sensor wires through the cutouts. Secure with two T-20 Torx screws.
- 6** For each actuator, push the coupling/shaft assembly downward with a flat blade screwdriver until the slot on the coupling engages the valve rotor index pin.

NOTE

If the coupling and valve do not engage, check that both are fully counterclockwise and try again. If necessary, turn the shaft slightly to engage the coupling.

- 7 For each actuator, continue to turn the shaft counterclockwise until snug, to ensure that the valve and actuator are both in the OFF position.

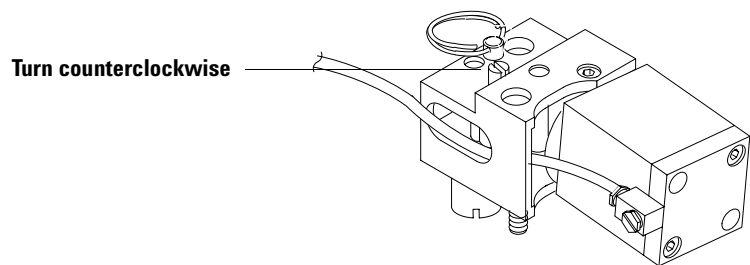


Figure 14 Turning the valve off

- 8 Tighten the link arm lock screw firmly.

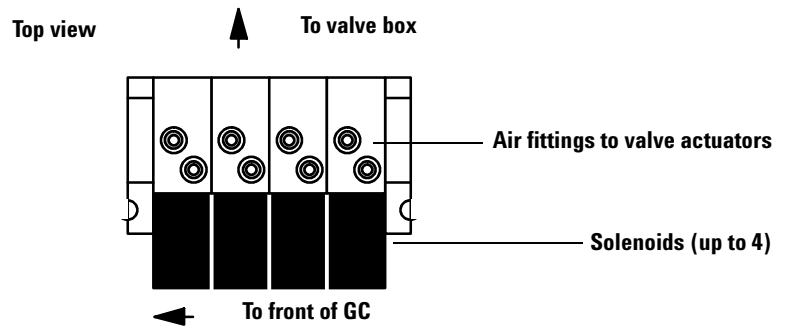
Plumb the actuators

NOTE

The valve actuators are plumbed at the factory. This procedure is provided in case you need to plumb the actuators in a manner other than the factory configuration.

Each valve actuator is driven by two tubes that connect to a solenoid through two connectors on top. These connectors do not require tools.

- To make a connection, push the tubing down into the connector as far as it will go.
- To remove a tube from a solenoid connector, press down on the plastic insert in the connector and pull the tubing straight up.



Although the solenoids are controlled by Valve # 1 through 4 (if you used the default wiring scheme), you can arrange your valves in the valve box as you wish. Which driver controls which valve depends entirely on how you choose to plumb the actuators.

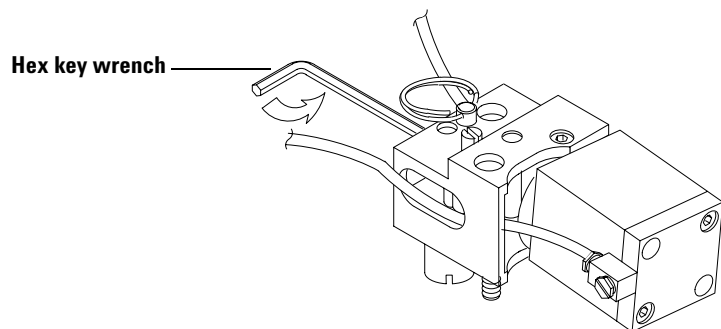
Restore the GC to Operating Condition

- 1 Reinstall any covers that were removed.
- 2 Plug in the power cord and turn on the GC.
- 3 Configure the valves. See the GC's operating instructions if you need help with this step.
- 4 Connect the solenoid air supply line to a source of clean, dry compressed air at 0.38 MPa (55 psi). High purity is not required; a clean house air supply is adequate.

NOTE

If your detector also uses air, its operation may be affected by pulses in a shared air line. The solenoid air supply should be separate from the detector air supply.

- 5 Turn on the air supply to the solenoid valves.
- 6 Use a flat head screwdriver to turn each valve ON and OFF. Ensure that each valve is physically in the OFF position (full counterclockwise).
- 7 Use the 3-mm hex key wrench to tighten the link arm lockscrew by rotating it clockwise until very tight.



Common Valve Configurations

1 The next several pages show some commonly used valve configurations.

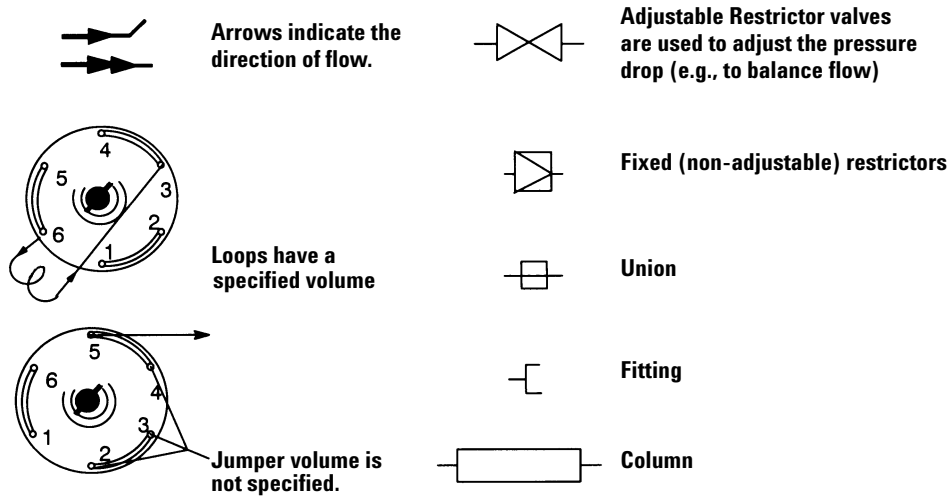
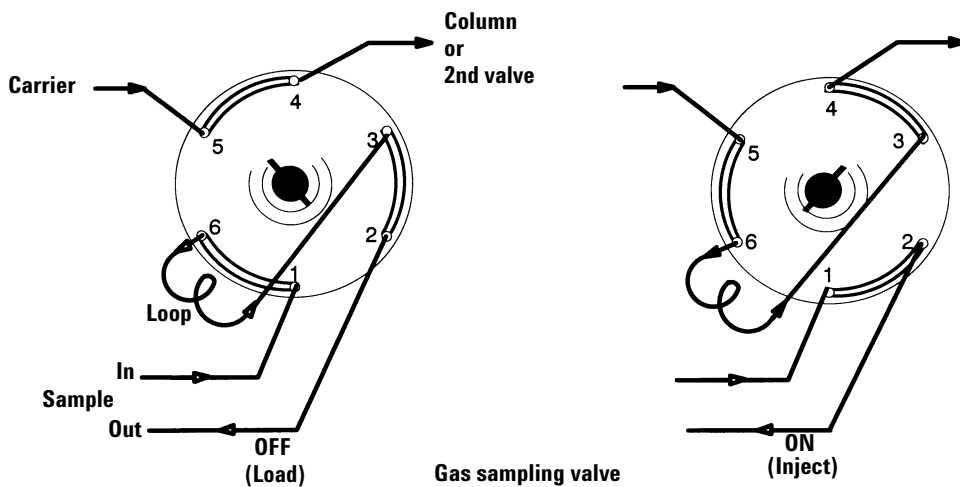
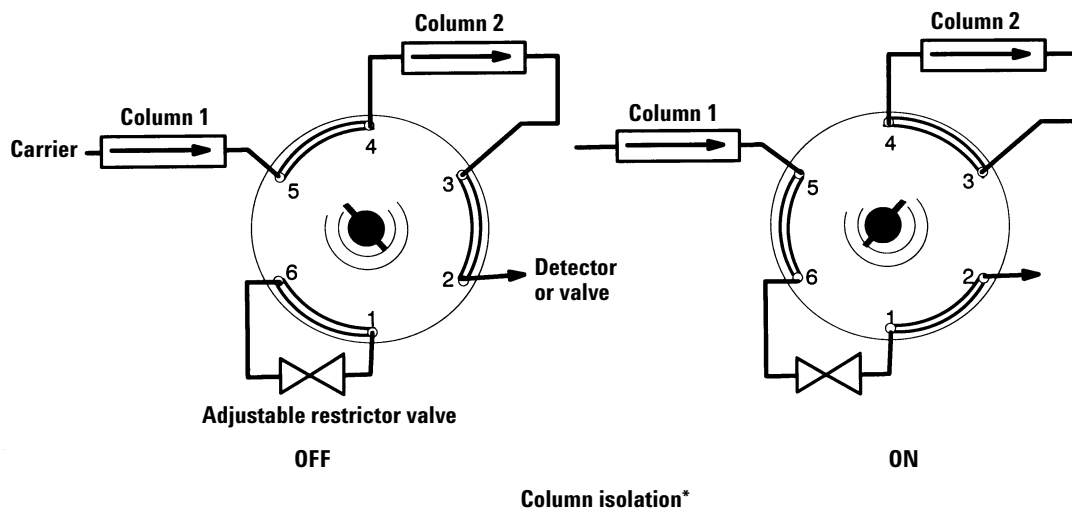


Figure 15 Valve configuration legend

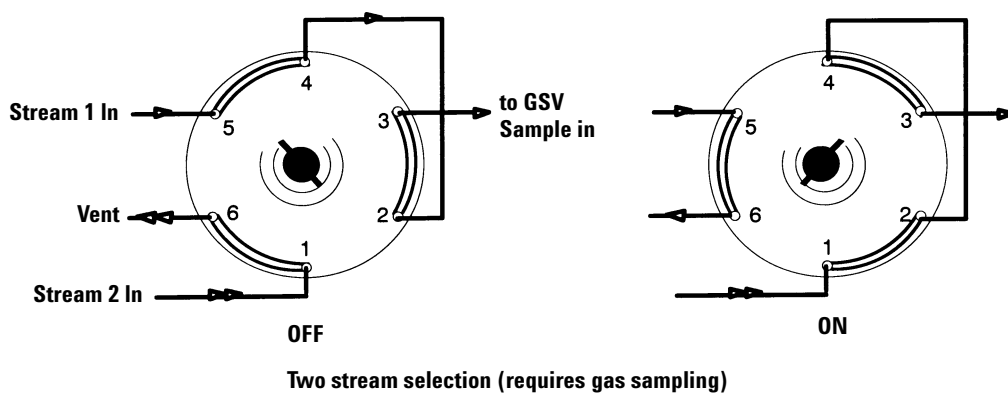
Valve plumbing tips

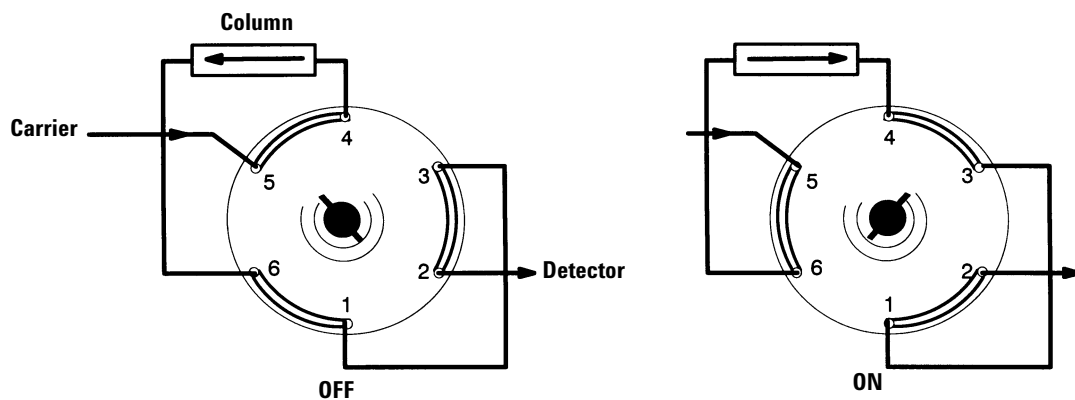
- Use bulkhead fittings with attached tubing for column connections. Mount the fitting, pointing down, on the left or right nut plate and secure with a retaining nut. Connect the free end of the tubing to the valve.
- The best way to cut narrow tubing is with a tubing cutter designed for this task. If some other cutter is used, check:
 - The tubing bore is not restricted at the cut end
 - The cut is at right angles to the tubing
 - There are no burrs that might interfere with connections.
- Avoid kinks in the tubing.



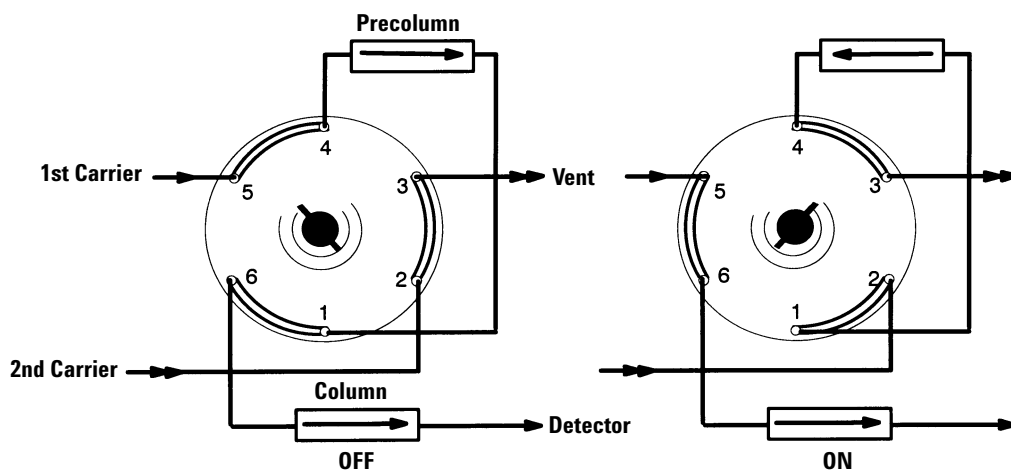


*Temperature limited to 235 °C by micrometering needle valves

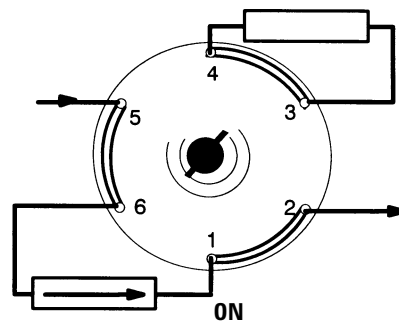
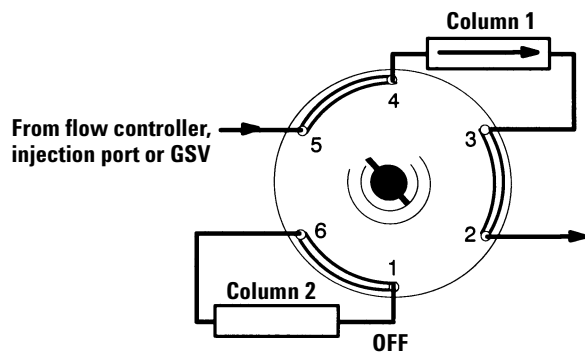




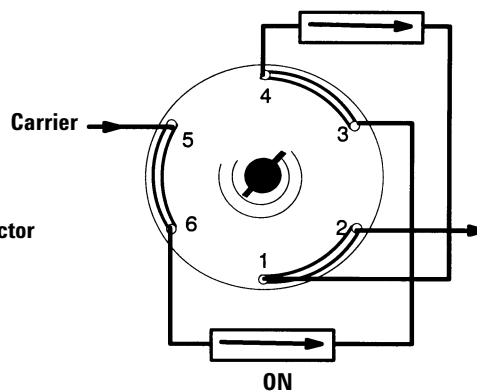
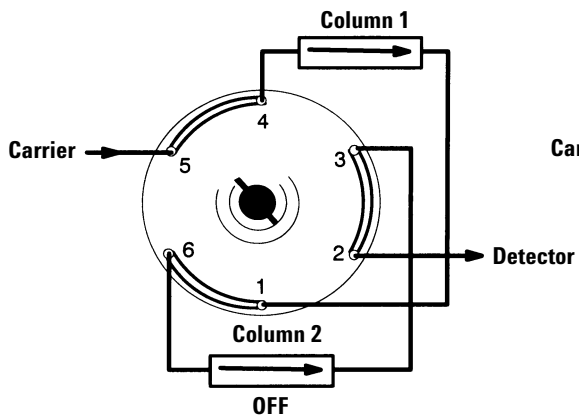
Backflush to detector



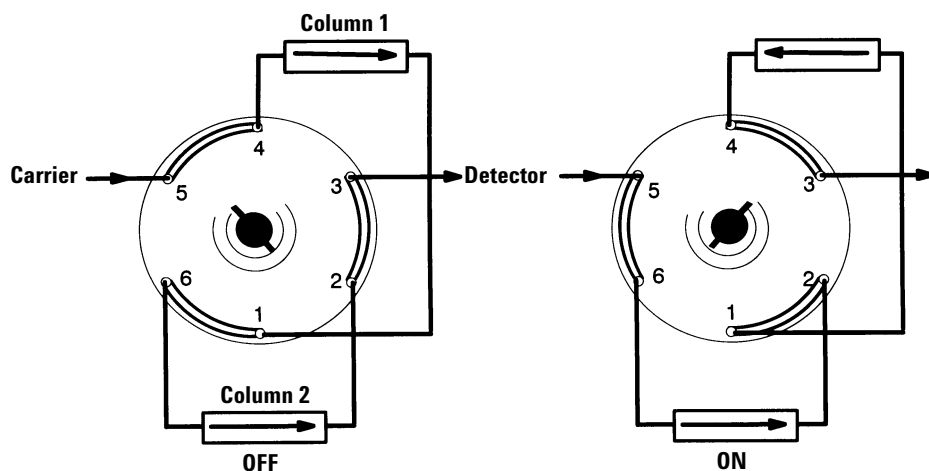
Backflush a precolumn to vent



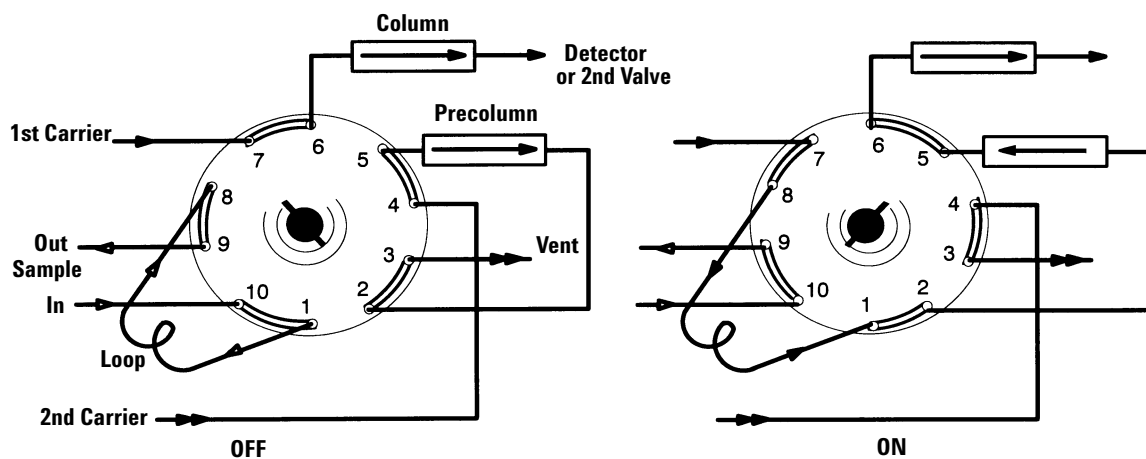
Column selection (unused column isolated)



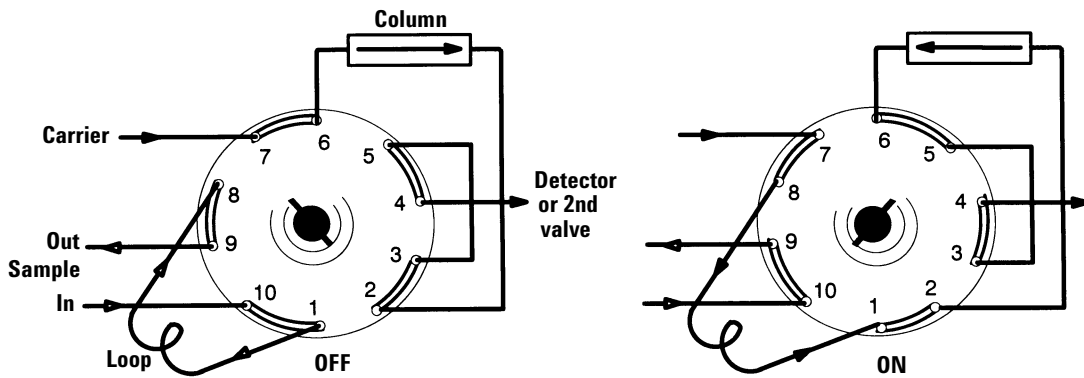
Sequence reverse



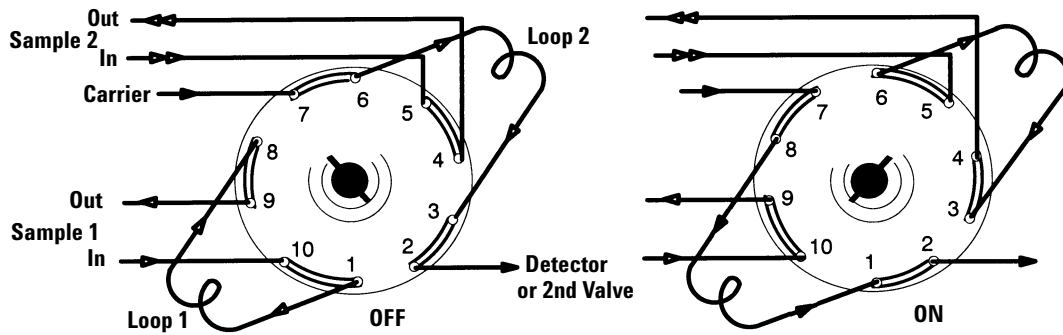
Sequence reverse with backflush of column 1



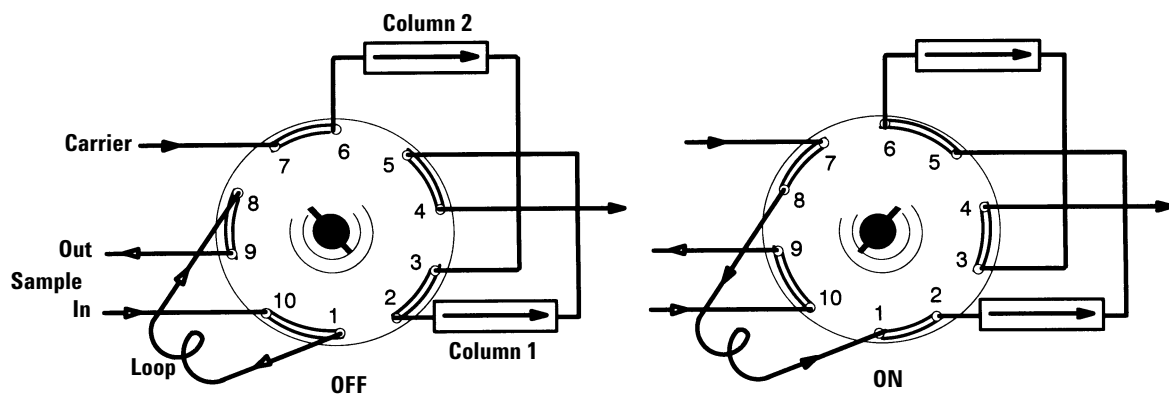
Gas sampling with backflush of precolumn to vent



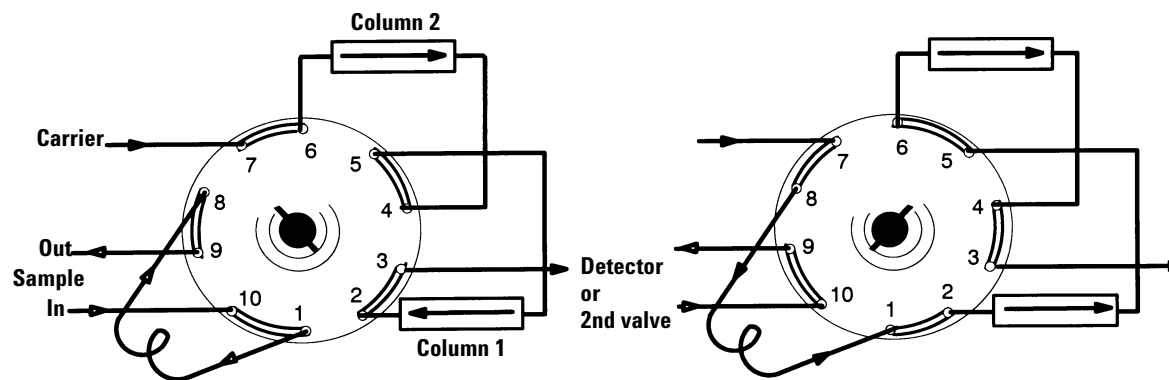
Gas sampling with backflush to detector



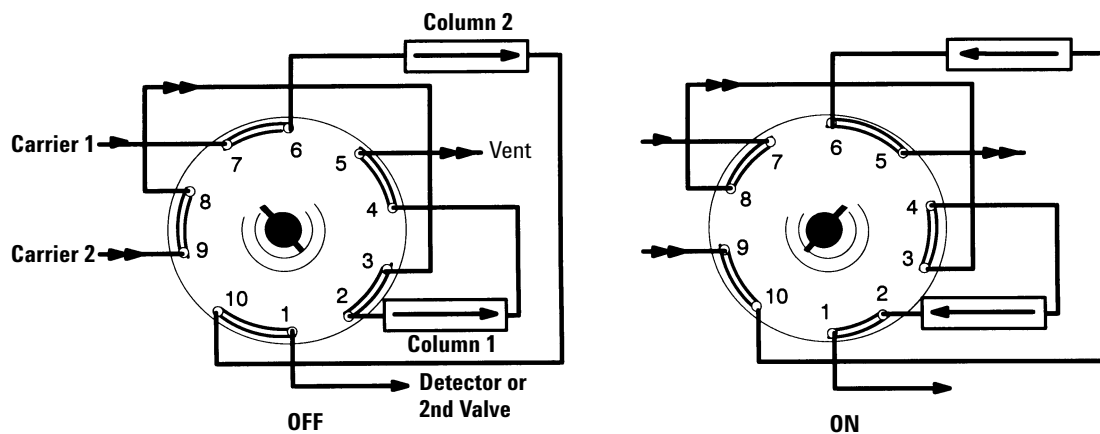
Gas sampling of alternate streams



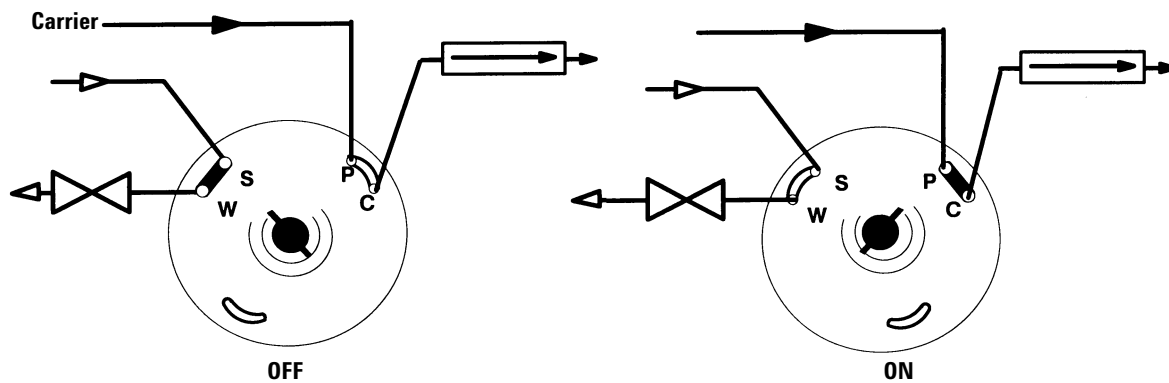
Gas sampling with sequence reverse



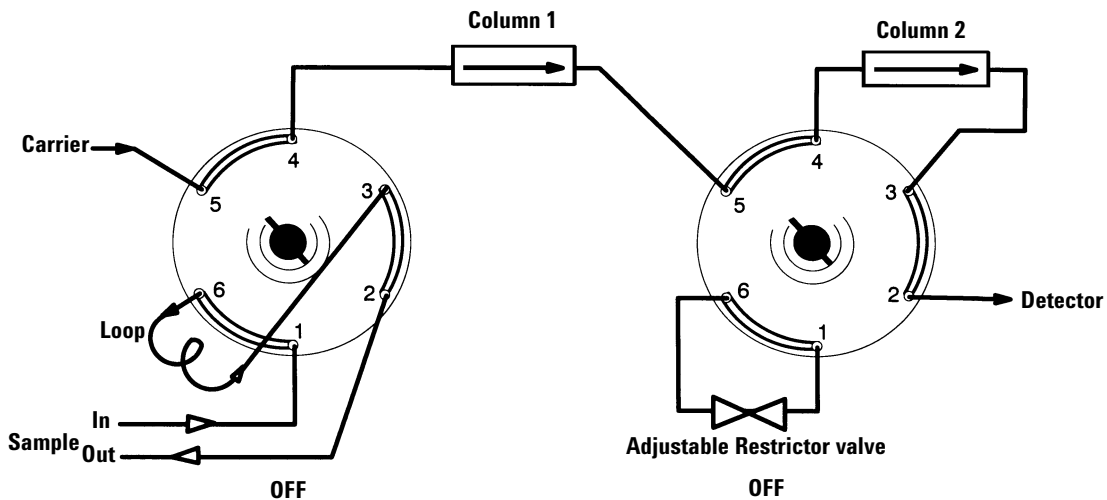
Gas sampling with sequence reverse and backflush of column 1



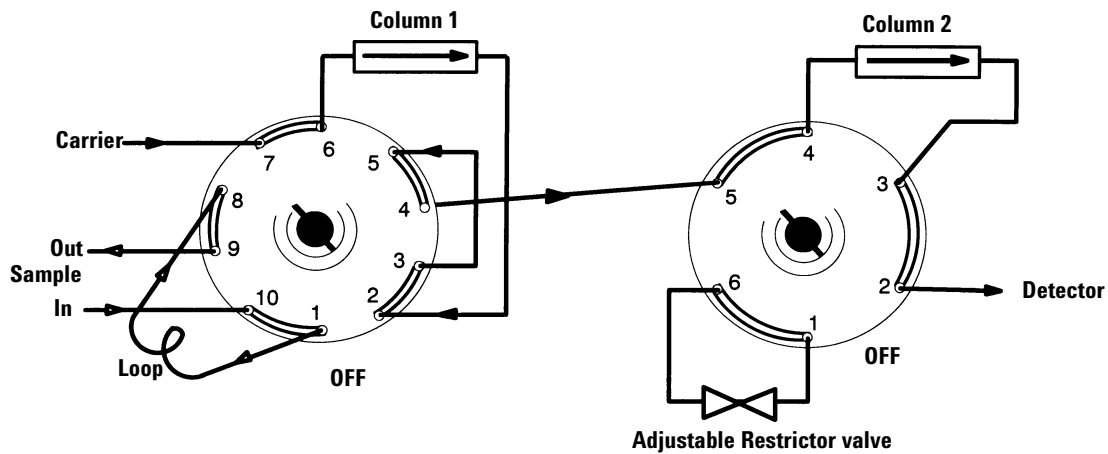
Column selection with backflush to vent



Liquid sampling



Gas sample and column isolation



Gas sample/backflush and column isolation



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